GCCS System Integration Support

JEPES Preliminary Software Design
Gain Momentum GUI

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JEPES PRELIMINARY SOFTWARE DESIGN GAIN MOMENTUM GUI
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1.0 SUMMARY

This section provides an overview for the preliminary design of converting the Joint Engineer Planning and Execution System (JEPES) Graphical User Interface (GUI) from ORACLE Forms 4.0 to Sybase Gain Momentum (GM).

1.1 Introduction

JEPES is a subsystem within the Global Command and Control System (GCCS). JEPES is used in assisting the planner in developing the Civil Engineering Support Plan (CESP) annex to an Operation Plan (OPLAN). It starts with the civil engineering data imported from the Joint Operation Planning and Execution System (JOPES) Core database. JEPES will identify facilities required to support deploying forces, apply existing assets to fulfill these requirements, and assign engineering resources to construct remaining unsatisfied requirements. Figure 1.1-1 describes the JEPES inputs and outputs. The bold boxes describe the Real Property Inventory (RPI) interface. This is a new functionality and will be discussed further in the JEPES Preliminary Design Document RPI Interface. Refer to the JEPES Users Manual for more information on JEPES.

This preliminary software design document describes the JEPES GUI conversion from ORACLE Forms 4.0 to Sybase GM. JEPES functionality will remain the same. This document includes a listing of the JEPES GUI applications, JEPES and JOPES GUI standards, a description of the GM Data Manager, and provides a sample of new prototype screens.

1.2 Summary

Figure 1.2-1 describes the JEPES System Architecture, and indicates the updated section by the shaded box. Figure 1.2-2 describes the JEPES processes with the Gain Momentum processing as the updated section; i.e., bold and italic lettering. Design Changes/Improvements section describes the changes/improvements that will be made to the screens. These changes are due to taking advantage of GM's features and to following the GCCS Style Guide (such as the Data Manager and picklists). Only the ORACLE Forms 4.0 software will be converted to GM. The remaining software (C-Shell Scripts, Ada code, Structured Query Language (SQL) code, and Applixware scripts) will stay the same. The ORACLE Forms 4.0 invokes C-Shell Scripts, which executes the SQL and Ada software. The GM code will invoke the same C-Shell Scripts. GM's Data Manager will be used for querying, updating, adding, and deleting rows in an ORACLE table. This functionality is performed in the JEPES Database Maintenance subsystem.

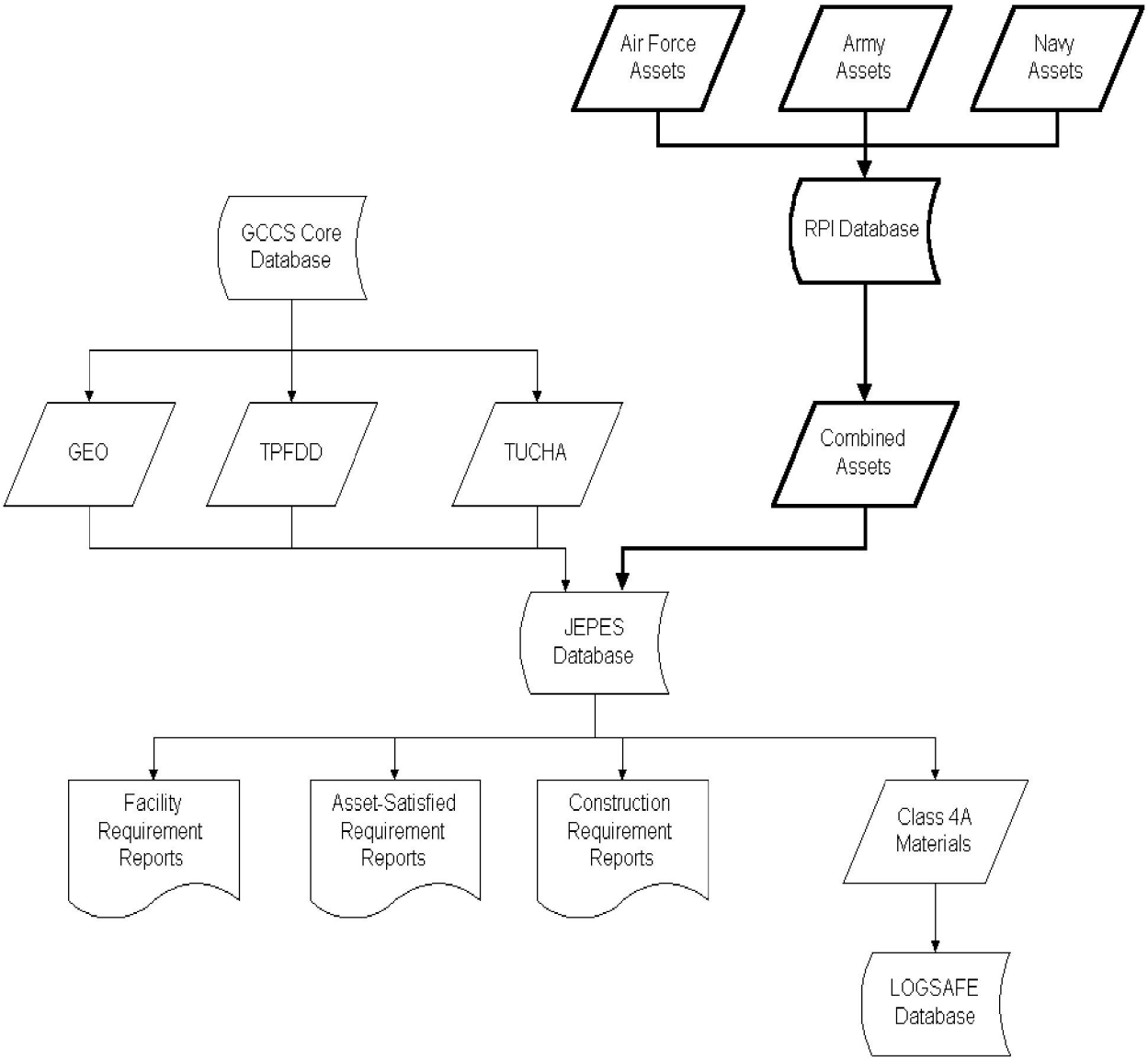


Figure 1.1-1. JEPES Data Flow

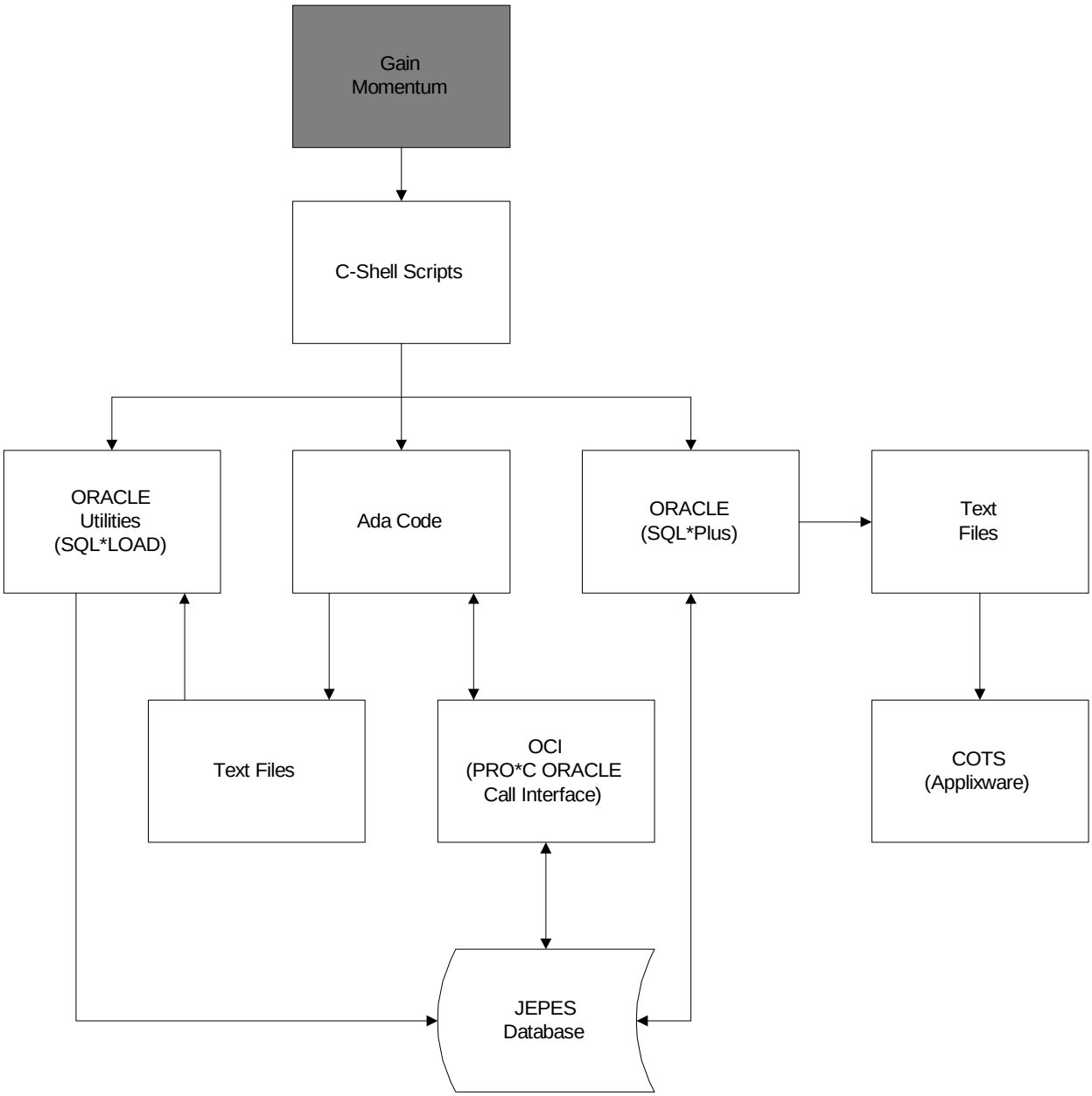


Figure 1.2-1. JEPES System Architecture

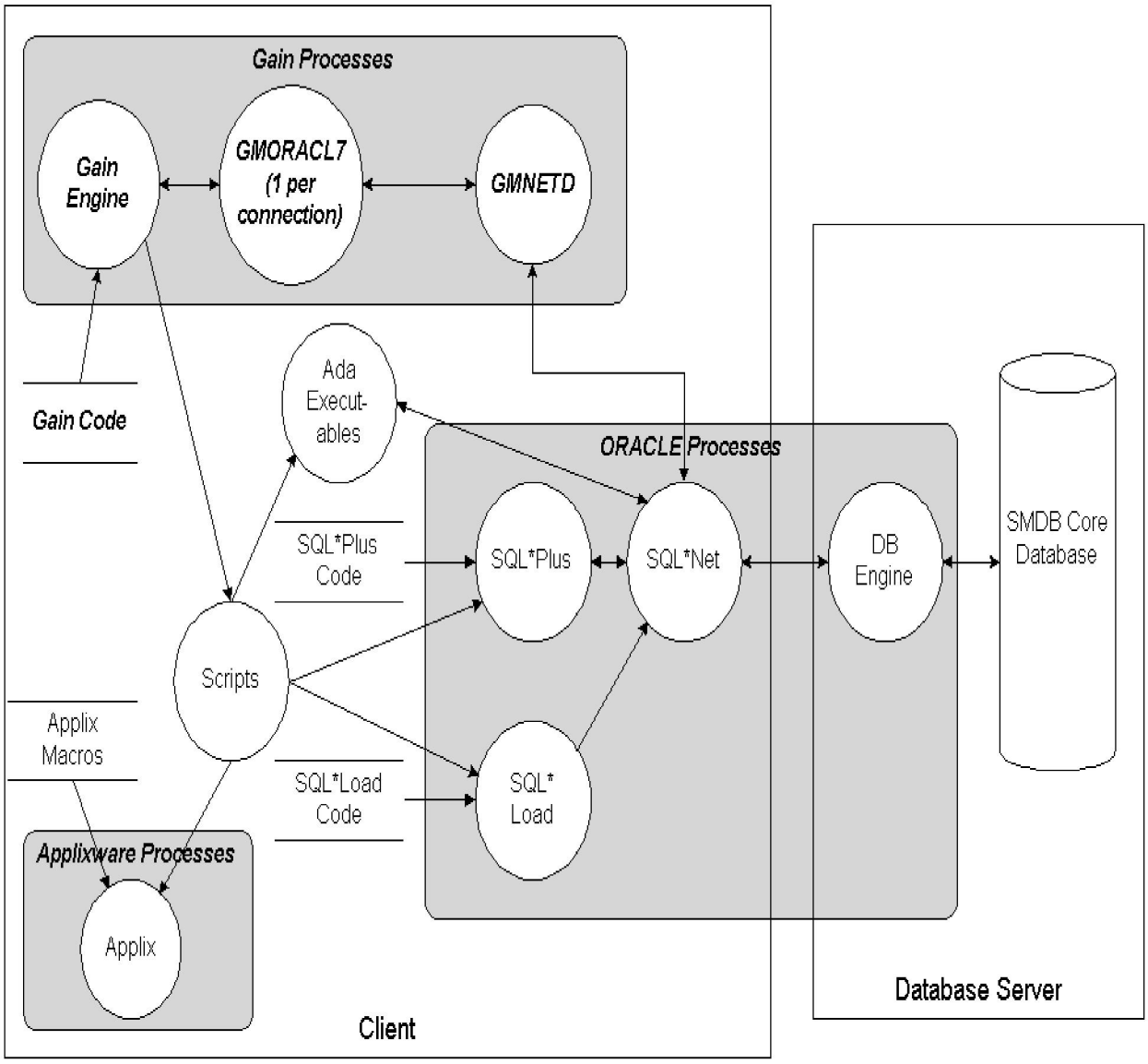


Figure 1.2-2. JEPES Processes

1.3 Conclusions

In conclusion, JEPES will be converted from ORACLE Forms 4.0 to Sybase GM.

2.0 REFERENCED DOCUMENTS

The following documents are applicable or referenced in this document:

a. Defense Information Systems Agency, GCCS System Integration Support, Joint Engineer Planning and Execution System (JEPES), Users Manual, Washington, D.C., May 15, 1995.

b. Sybase, Developing Database Applications with Gain Momentum, Palo Alto, CA, June 30, 1993.

3.0 GUI LIBRARIES AND APPLICATIONS

This section lists and describes the JEPES GUI libraries and their applications.

The JEPES GUI will reside in the following GM libraries: JEPES Main, JEPES Database (DB) Maintenance, and JEPES Requirements Analysis. The library JEPES Main will contain the JEPES main menus, including the Utilities, Requirements Generation, Report Generation, Non-Unit Cargo, and Logistics Sustainability Analysis (LSA) subsystem screens. The library JEPES DB Maintenance will contain all the Database Maintenance subsystem screens. The JEPES Requirements Analysis library will contain all the screens that pertain to Requirements Analysis subsystem, such as Skill Substitution and Engineer Attrition.

The JEPES Main library contains the following applications:

1. **JEPES Main Menu**. The JEPES Main Menu application contains the following screens:

   a. Classification - User selects the OPLAN classification.

   b. JEPES Main Menu - Screen displays the following deliberate engineering options:

      (1) Utilities - The user selects options to import/export the JEPES database and extract Time-Phased Force and Deployment Data (TPFDD) and Type Unit Characteristics (TUCHA) data file.
      (2) Database Maintenance - The user selects whether to query/update a JEPES table or analyze the database.
      (3) Requirements - The user selects options to generate requirements and, then, analyze the generated requirements.
      (4) Reports - The user selects options to generate JEPES standard reports or user-defined reports. Also, Ad-Hoc Query (AHQ) capability is available.
      (5) Support Function - The user selects options to execute the Non-Unit Cargo and LSA functions.

2. **JEPES Help**. This application displays help screens.

3. **Import/Export JEPES Database**. This application invokes the importing and exporting of the JEPES database. Also, a listing of export files can be displayed.

4. **Requirements Generation**. Civil Engineering requirements can be generated for the following: unit-allocated, planner facility, population, and base. A listing of errors/warnings generated by the model can be displayed or printed. The generated requirements can then be loaded into the Project table.

5. **Standard Reports**. This application allows the user to generate Requirement Generation and Requirement Analysis reports without having to rerun the model.

6. **User Reports**. This application allows the user to generate user-defined reports. A listing of these reports is displayed.

7. **Non-Unit Cargo**. This application generates Cargo 4A data for input into the Logistics Sustainment Analysis and Feasibility Estimator (LOGSAFE) subsystem.

8. **LSA**. This application creates LSA data, displays LSA charts, and provides an American Standard Code for Information Interchange (ASCII) text file for input into LSA subsystem.

The JEPES DB Maintenance library contains the following applications:

1. **Database Maintenance**. This application lists the JEPES OPLAN-dependent and JEPES OPLAN-independent tables for querying and editing.

2. **Database Analysis**. This application lists JEPES tables that can be checked for data discrepancies with other JEPES tables.

3. **Asset/War Damage Factor**. This application allows the user to query, add, update, and delete data from the Asset and War_Damage_Factor tables.

4. **Base Far Construction Policy**. This application allows the user to query, add, update, and delete data from the Base_Fac_Construction_Policy table.

5. **Backup Supply**. This application allows the user to query, add, update, and delete data from the Backup_Supply table.

6. **Base Complex/Base Location**. This application allows the user to query, add, update, and delete data from the Base_Complex and Base_Location tables. It also provides rebasing capabilities. When a user wants to add/update or delete a base, other JEPES tables will also get updated. Pop-up screens are provided to inform the user.

7. **Deployed Unit**. This application allows the user to query, add, update, and delete data from the Deployed_Eng_Sensitive_Unit (troop) table.

8. **Engineering Support**. This application allows the user to query, add, update, and delete data from the Engineering_Support table.

9. **Plan Far Construction Policy**. This application allows the user to query, add, update, and delete data from the Plan_Fac_Construction_Policy table.

10. **Operation**. This application allows the user to query, add, update, and delete data from the Operation table.

11. **Planner Input Requirements**. This application allows the user to query, add, update, and delete data from the Planner_Input_Requirements table.

12. **Project**. This application allows the user to query, add, update, and delete data from the Project table.

13. **Component**. This application allows the user to query, add, update, and delete data from the Component table.

14. **Engineering Unit Capability**. This application allows the user to query, add, update, and delete data from the Engineering_Unit_Capability table.

15. **Equipment Planning Factor**. This application allows the user to query, add, update, and delete data from the Equipment_Planning_Factor table.

16. **Equipment Type**. This application allows the user to query, add, update, and delete data from the Equipment_Type table.

17. **Facility Category**. This application allows the user to query, add, update, and delete data from the Facility_Category table.

18. **Facility Category Substitute**. This application allows the user to query, add, update, and delete data from the Facility_Category_Substitute table.

19. **Facility Component**. This application allows the user to query, add, update, and delete data from the Facility_Component table.

20. **Facility Requirement**. This application allows the user to query, add, update, and delete data from the Facility_Requirement table.

21. **General Planning Factor**. This application allows the user to query, add, update, and delete data from the General_Planning_Factor table.

22. **Unit Equipment**. This application allows the user to query, add, update, and delete data from the Unit_Equipment table.

23. **Unit Type**. This application allows the user to query, add, update, and delete data from the Unit_Type table.

24. **RPI Asset**. This application allows the user to query the RPI Asset table. This is a new application and the RPI Preliminary Design document will contain more information.

The JEPES Requirements Analysis library contains the following applications:

1. **Apply Assets**. This application has the following screens:

   a. User can select which assets to apply (U.S., Host Nation (HN), or contractor) and whether to use asset substitution.

   b. User can select whether to display or print errors and warnings produced from the JEPES model and whether to load the data generated from the model into the Unscheduled Project table.

   c. There are options available to generate asset-specific reports.

2. **Apply Engineering Resource**. This application has the following screens:

   a. User can select which engineering resources to apply (HN or contractor) and whether climatic factors are applied.

   b. User can select whether to display or print errors and warnings produced from the JEPES model.

   c. There are options available to generate construction requirement reports.

3. **OPLAN ID**. The user enters the OPLAN Identification (ID).

4. **Engineer Phase-In Efficiency**. The user can select an engineering phase-in plan.

5. **Engineer Attrition**. The user can add engineering attrition when determining construction requirements.

6. **Skill Substitution**. The user can determine skill substitution for horizontal, vertical, and other engineers.

7. **Region/Time Constraint**. The user can add a region and/or time constraint for the Apply Assets and Apply Engineering reports.

8. **War Damage Assessment**. The user can decide whether to add war damage assessment to the apply engineering resources model.

9. **Engineering Force Utilization**. The user determines whether force utilization is for an entire region or a base only.

4.0 JEPES GUI GUIDELINES

This section lists GM standards. More standards may be added as the software is developed.

4.1 JOPES User Interface Guideline

Where possible, the JOPES User Interface Guideline (see Appendix A) is followed. Here is a list of standards mentioned in the document that JEPES will be following.

4.1.1 Font Selection

1. Font: "System Default"
2. Size: 10 pt.

This is GM's default font.

4.1.2 Window Design Conventions

All windows will follow this naming convention:

JEPES: < descriptive window title >

The window title should reflect the title of the calling menu selection or button. For example, from Database Maintenance, if the user selects Asset, the Asset window should say JEPES: Asset table.

4.1.3 Window Size

The maximum size will be 9 inches by 6 inches.

4.1.4 Buttons

1. Button labels should be mixed case and bold text. (Acronyms are in caps.)

2. Background color of gray75.

3. Where possible use the gain default height of 0.24 inches.

4. Width dependent on button label and context or the same width if all buttons can fit in one row.

5. Displayed .2 inches from the top and the left side. The distance between buttons is also .2 inches.

4.1.5 Button Labeling

- **Previous**. Displays previous page of information. (Same as JEPES ORACLE Forms 4.0 version.)

- **Main Menu**. Exits to the JEPES Main Menu. (Exit in JEPES ORACLE Forms 4.0 version.)

- **Apply**. Executes the control settings in a window but does not close the window. (Commit in JEPES ORACLE Forms 4.0 version.)

- **OK**. Executes the control settings in a window and closes the window. (Commit in JEPES ORACLE Forms 4.0 version.)

4.1.6 Colors

JEPES will follow the screen colors described in the JOPES User Interface Guideline (see Appendix A).

4.1.7 Classification

Classification will be displayed at the bottom on all screens.

- Lakegreen - unclassified,
- Cyan - confidential, and
- Red - secret.

4.2 JEPES Specific Standards

Here is a listing of JEPES specific standards that are not mentioned in the JOPES User Interface Guideline (see Appendix A).

4.2.1 Database Values

When displaying database values:

1. Left-justified for characters,

2. Right-justified for numbers, and

3. Enforce uppercase when querying, updating, and inserting data. ORACLE is case-sensitive.

4.2.2 Database Maintenance Buttons

The Database Maintenance screens will use the following buttons defined in the GM Data Manager. Displayed in this same order from left to right at the top.

1. Previous,
2. Query,
3. Clear to Query,
4. Clear to Insert,
5. Apply,
6. Delete, and
7. Help.

4.2.3 Picklists

Where possible, another table will be used when displaying a picklist. Section 6.0, Data Manager, provides a definition of a picklist. Here are the following data elements and their primary tables that should be used for displaying a picklist.

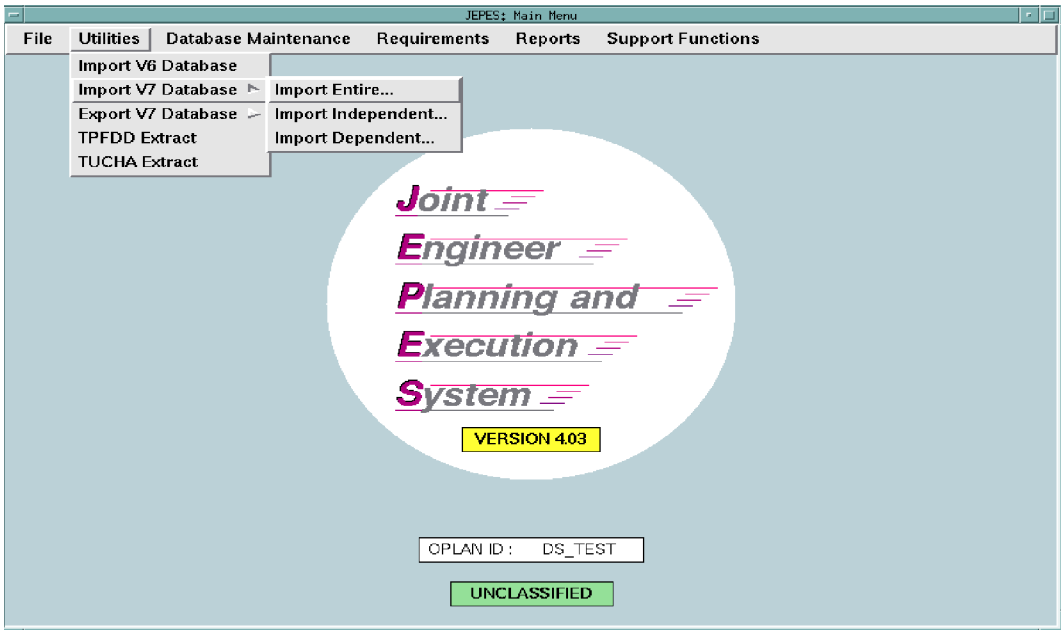
1. Bse_Cmplx_Nbr - Base_Complex
2. Geoloc_Code - Base_Location
3. DOD_Fac_Cat_Cd - Facility_Category
4. Cyst_Cd - Base_Location

More picklists may be defined at a later time.

5.0 DESIGN CHANGES/IMPROVEMENTS

This section describes the JEPES design changes. These changes are due to taking advantage of GM 's features (such as Data Manager and picklists), following the GCCS Style Guide, and making JEPES more user friendly.

1. **Pull-Down Menus**. JEPES ORACLE Forms 4.0 does not use pull-down menus but pop-up menus with buttons for traversing down the menu. With the GM conversion, some of the JEPES screens will convert to pull-down menus. Other JOPES applications, such as Requirements Development and Analysis (RDA) and LOGSAFE, use pull-down menus. The pull-down menu screens have a "cleaner" look and the menu traversal can be displayed. The Main Menu screen, shown in Figure 5.0-1, has been converted to a pull-down menu.



5.0-1. JEPES Main Menu

2. **OPLAN ID**. The Requirements Analysis, Non-Unit Cargo, and the LSA subsystems require the user to add the OPLAN ID. This seems like an unnecessary exercise since only one OPLAN can be executed at a time within JEPES. The new design will show the OPLAN ID on the main menu and at the start of Requirements Generation, Requirements Analysis, Non-Unit Cargo, and LSA processing. This OPLAN ID will come from the Operation table. The OPLAN ID will need to be reset when a user is creating a new OPLAN or importing a different OPLAN.

3. **Combined Add and Query/Update Screens**. JEPES ORACLE Forms 4.0 requires the user to enter a Database Maintenance table either in add or update/query mode. The new version of JEPES will allow the user to add or update/query in the same screen. See Section 7.0, Prototype Screens, for examples.

   Also, picklists will be added to provide a list of valid values. For example, a list of Base Complex Numbers from the Base_Complex table can be displayed when a user updates the Base Complex Number for the Deployed_Eng_Sensitive_Unit table.

4. **Rename JEPES Unit Type and Equipment Type Tables**. These table names are in conflict with the Unit_Type and Equipment_Type tables in the GCCS Core database. Therefore, these tables will be renamed to JEPES_Unit_Type and JEPES_Equipment_Type.

6.0 DATA MANAGER

This section describes Sybase GM's Data Manager, which is used for accessing ORACLE tables in the JEPES database.

GM's Data Manager will be used for querying, adding, updating, and deleting data from JEPES tables. In the JEPES Edit Tables subsystem, there are several JEPES tables that can be edited by the user. Each table will have a Data Manager associated with it. A Data Manager will be used to manage data returned from queries, control what is displayed, assemble SQL statements, and send these statements to the database. Data Manager will be used in all JEPES subsystems that query and/or update a table.

Data Manager has two modes: query and browse. When a Data Manager is in query mode, a user can only enter search criteria and not data for a new row. When a Data Manager is in browse mode, a user can view rows returned from a query, update rows, delete rows, and insert rows. To put a Data Manager in query mode, a user must invoke the **{Clear to Query}** button. To put a Data Manager in browse mode, a user can do one of the following:

- First query the database. If rows matching the search criteria are found, then the Data Manager is automatically in browse mode. If no rows are returned, then the Data Manager remains in query mode.

- Invoke the **{Clear to Insert}** button.

When a user first enters a JEPES table's edit screen, the Data Manager is automatically in Query mode. The user can either enter a search criteria and click **{Query}** or just click **{Query}** to display the entire table. To requery the database, the user must click **{Clear To Query}**. When displaying the entire table, all rows will be placed in the Data Manager's buffer; a vertical scroll bar is available for viewing all the rows. A horizontal scroll bar is available if there are too many data elements to be displayed in a screen. After querying, the Data Manager is put in browse mode, which allows the user to view, update, delete, and insert rows into the table. If no rows match the search criteria or no rows exist for that table, then a blank matrix table is displayed. The : (colon) sign, followed by the search criteria, then the % (percent) sign can be used as a wildcard. For example, when querying Facility Component, a user can enter *:11%* for the Servcomp code to retrieve all rows that have 11 as the first two digits of the Servcomp code. To update a record, the user edits the highlighted row, then clicks **{Apply}**. Several rows can be updated before clicking **{Apply}**. Invoking the **{Apply}** button commits the updated rows into the JEPES table. To insert a row, the user first invokes the **{Clear To Insert}** button to open a new row in the Data Manager buffer. The user must then click **{Apply}** to commit the new row into the JEPES table. To delete a row, the user invokes the **{Delete}** button to delete the highlighted row and then invokes the **{Apply}** button to commit the update.

Data from the JEPES tables can be presented in different formats using the Data Manager. In most cases, the matrix presenter is used. This presenter allows multiple data elements to be displayed at one time. The prototype screens show examples of the matrix presenter being used.

Picklists are used for some of the Database Maintenance screens. Picklists display a list of valid values from which a user can make a selection. The following describes the uses of picklists:

1. Picklists assist the user in determining what values can be entered when updating/adding a row in a JEPES table. A button beside the updated value will display a list of valid values. Also, a picklist can prevent a user from entering an invalid value.

2. A user can use a picklist when in query mode to specify a query criteria.

3. The picklist values can be hardcoded or retrieved from another JEPES table.

7.0 PROTOTYPE SCREENS

This section provides a sample of new GM screens for JEPES.

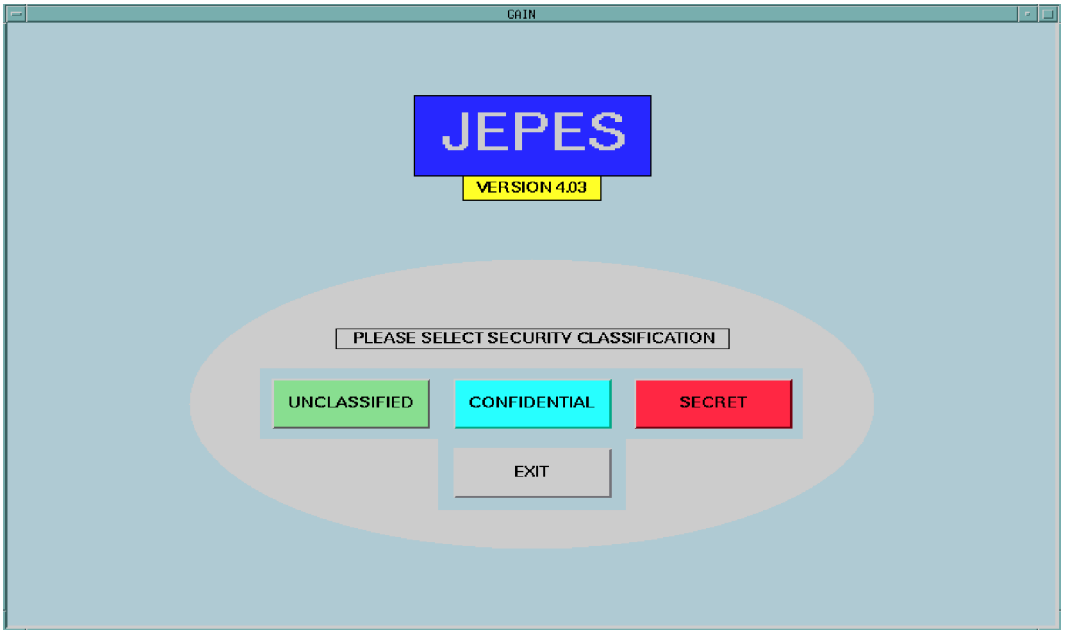


Figure 7.0-1. JEPES Classification

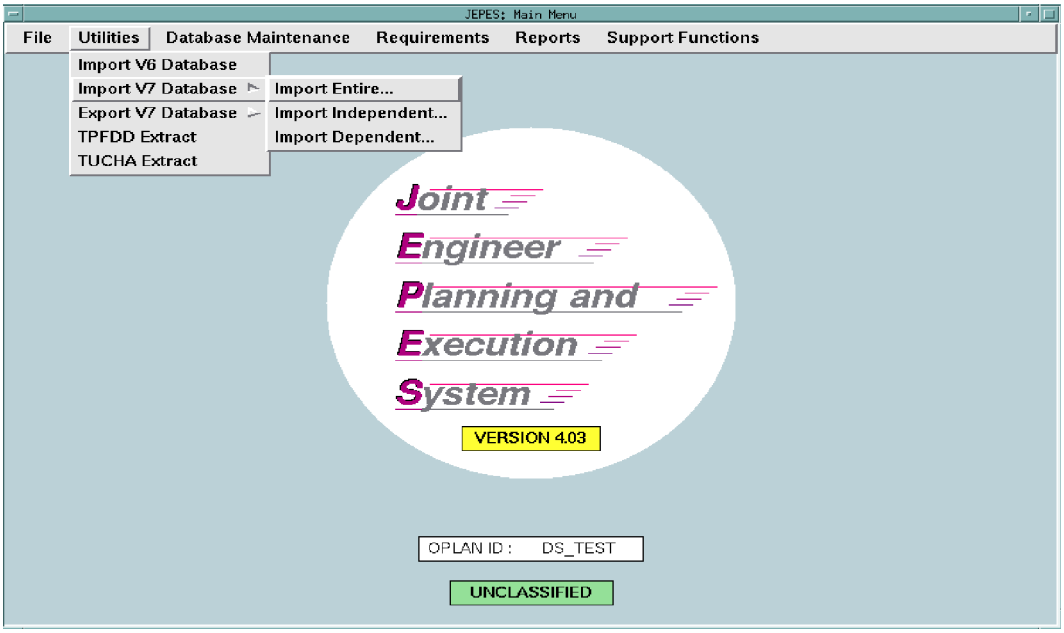


Figure 7.0-2. JEPES Main Menu

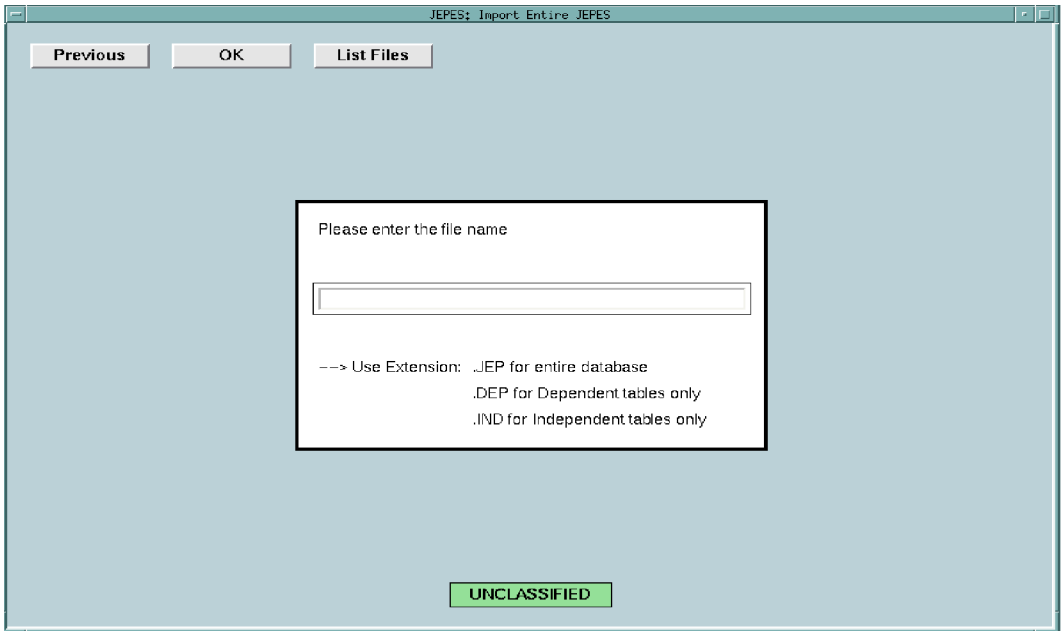


Figure 7.0-3. Import Entire JEPES

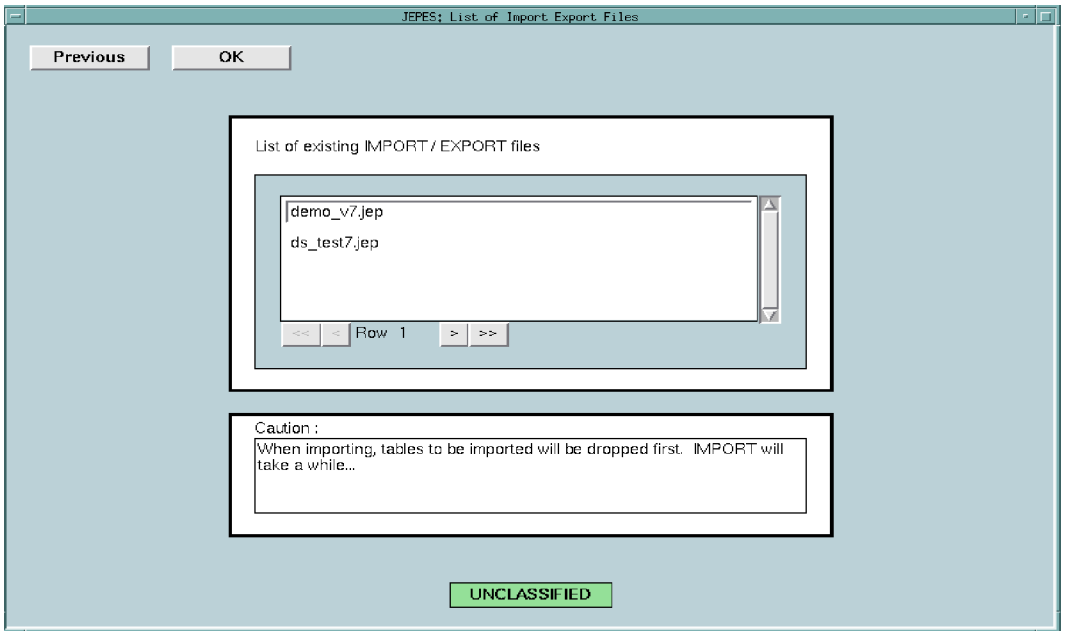


Figure 7.0-4. List of Export Files

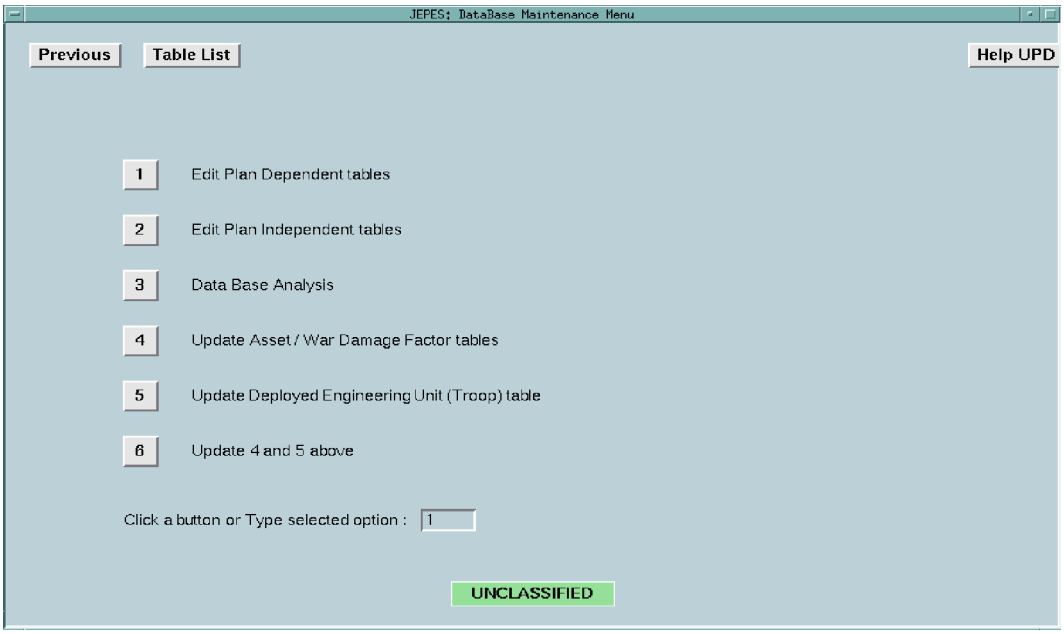


Figure 7.0-5. Database Maintenance Menu

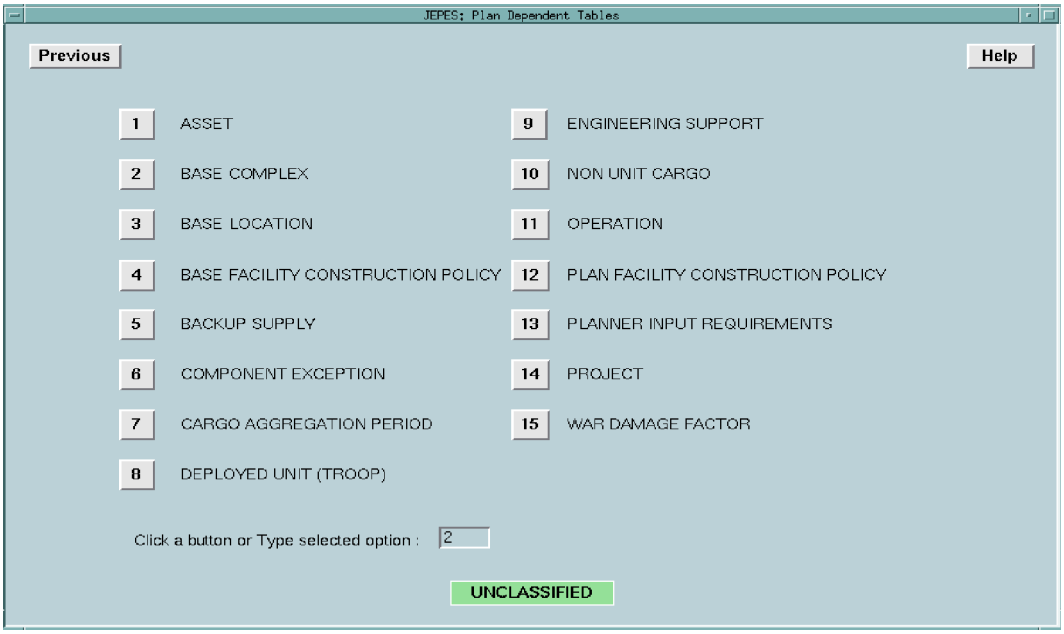


Figure 7.0-6. Plan Dependent Tables

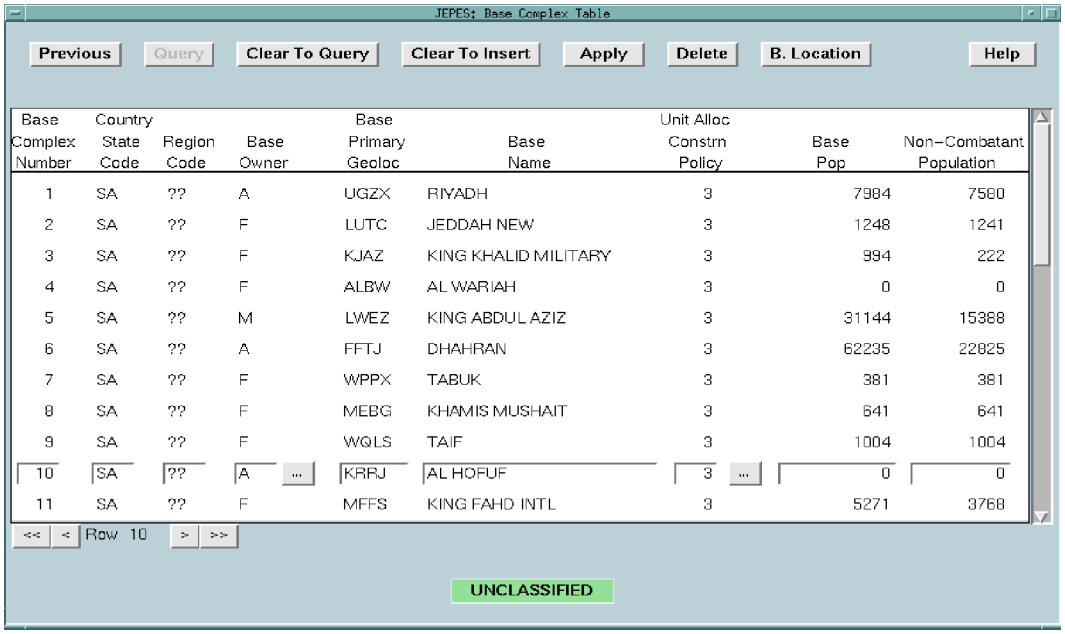


Figure 7.0-7. Base Complex Table

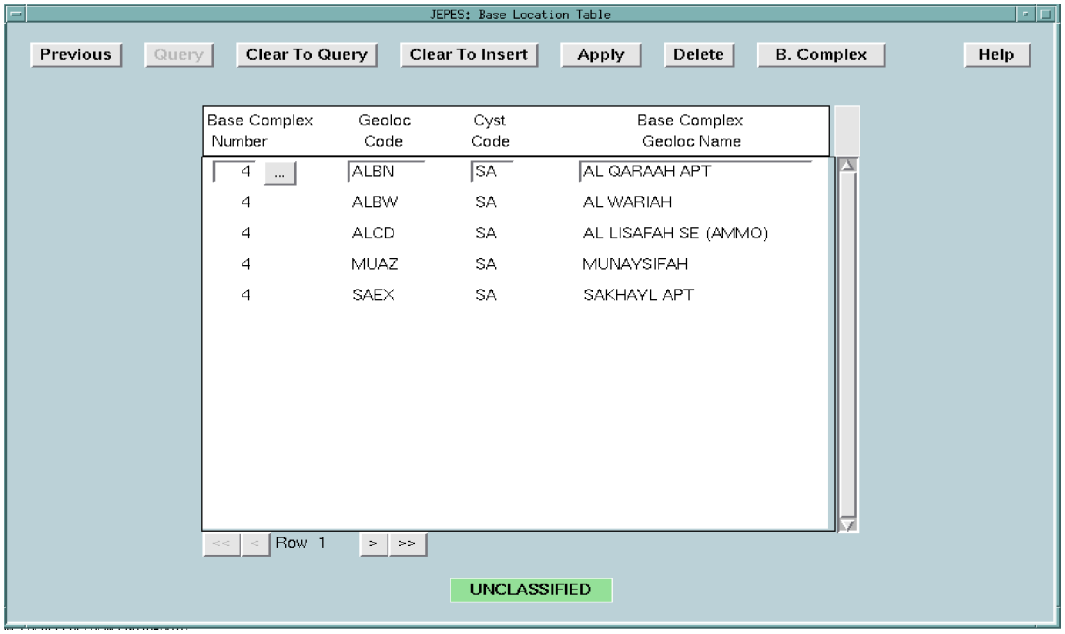


Figure 7.0-8. Base Location Table

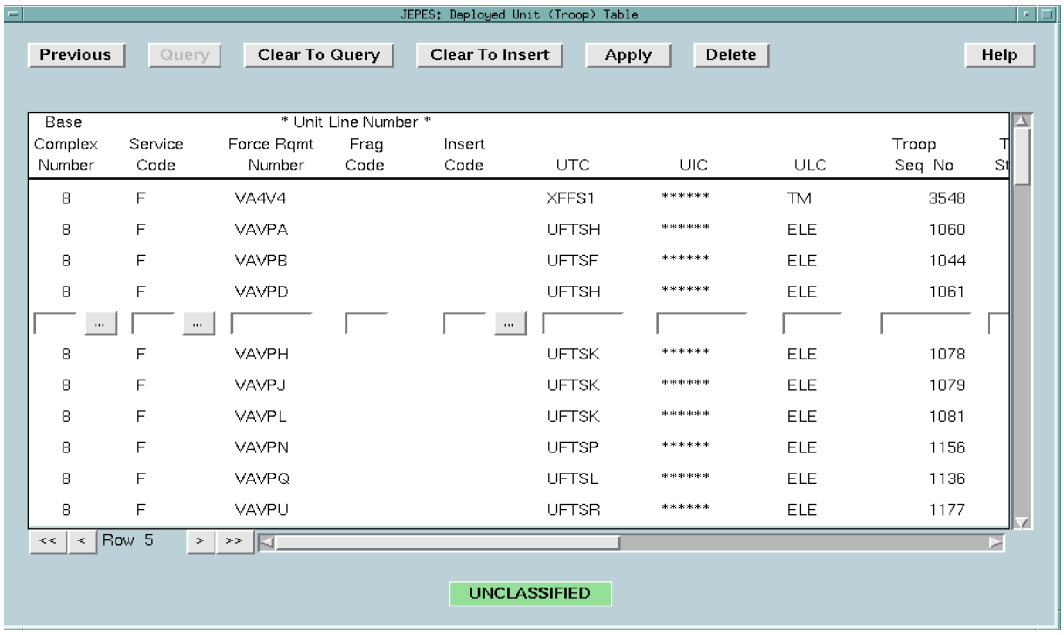


Figure 7.0-9. Deployed Eng Sensitive Unit Table

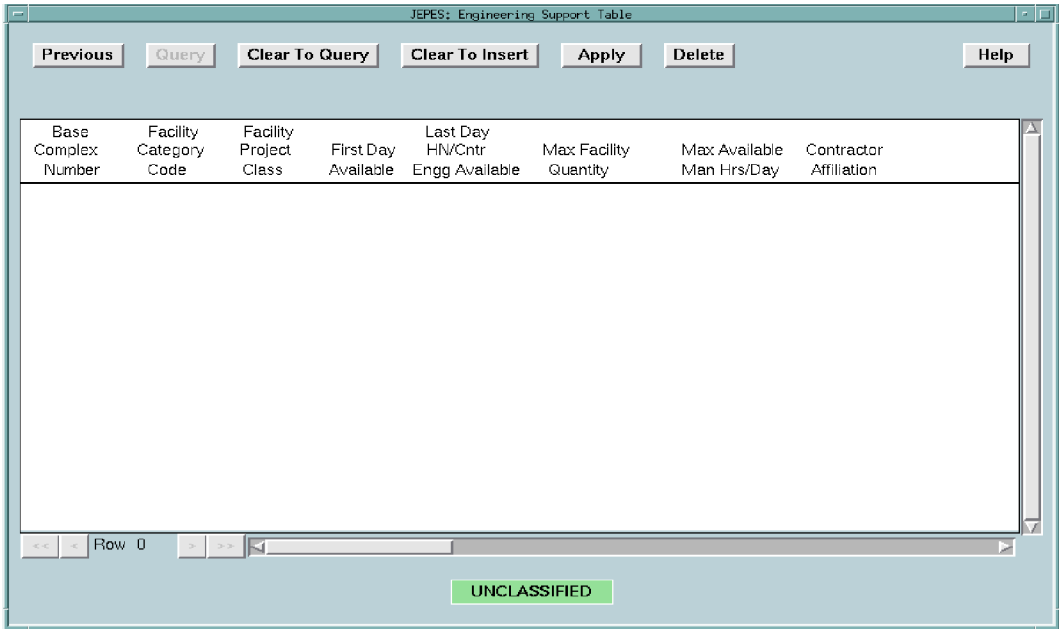


Figure 7.0-10. Engineering Support Table

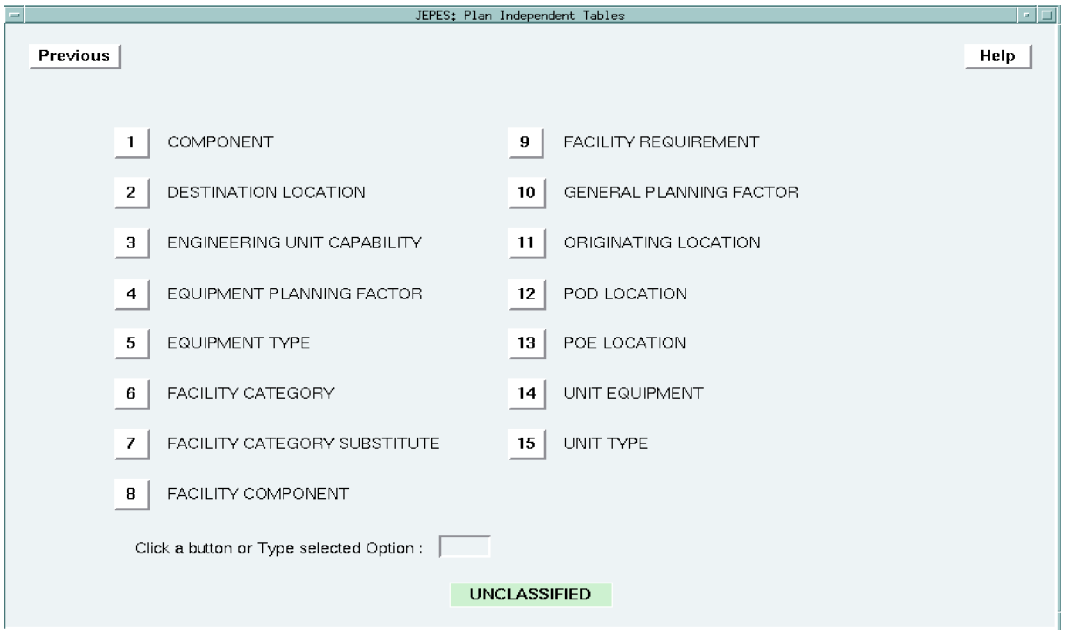


Figure 7.0-11. Plan Independent Tables

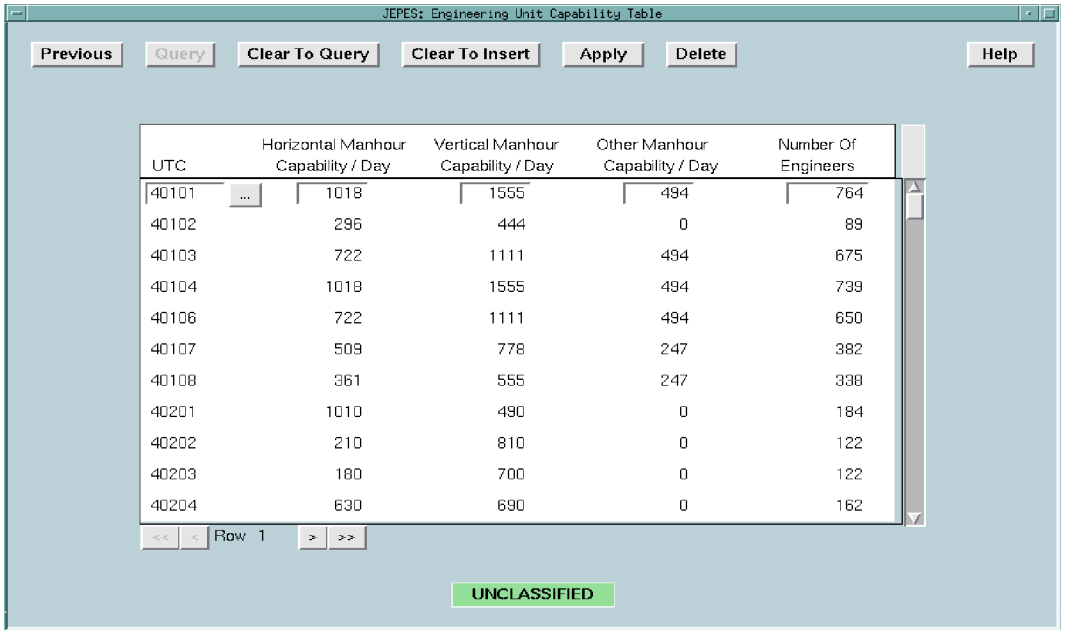


Figure 7.0-12. Engineering Unit Capability Table

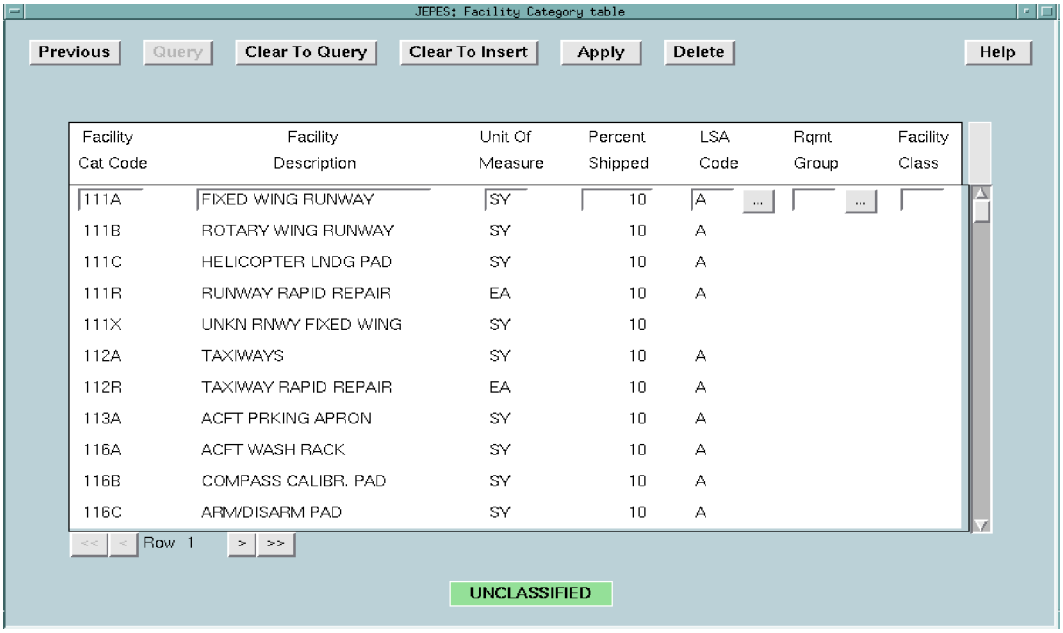


Figure 7.0-13. Facility Category Table

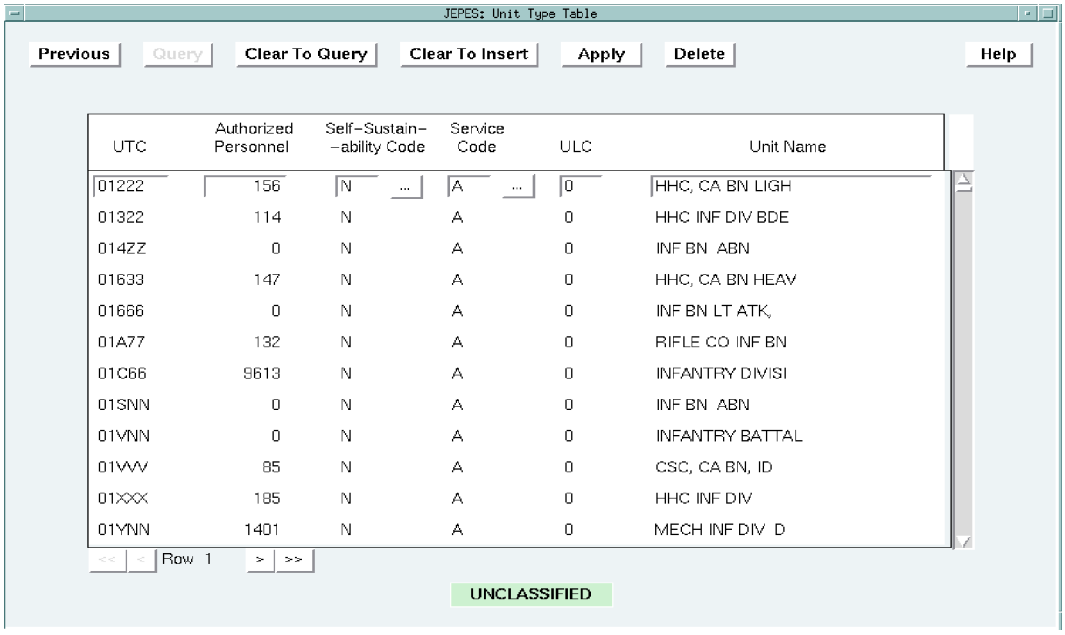


Figure 7.0-14. Unit Type Table

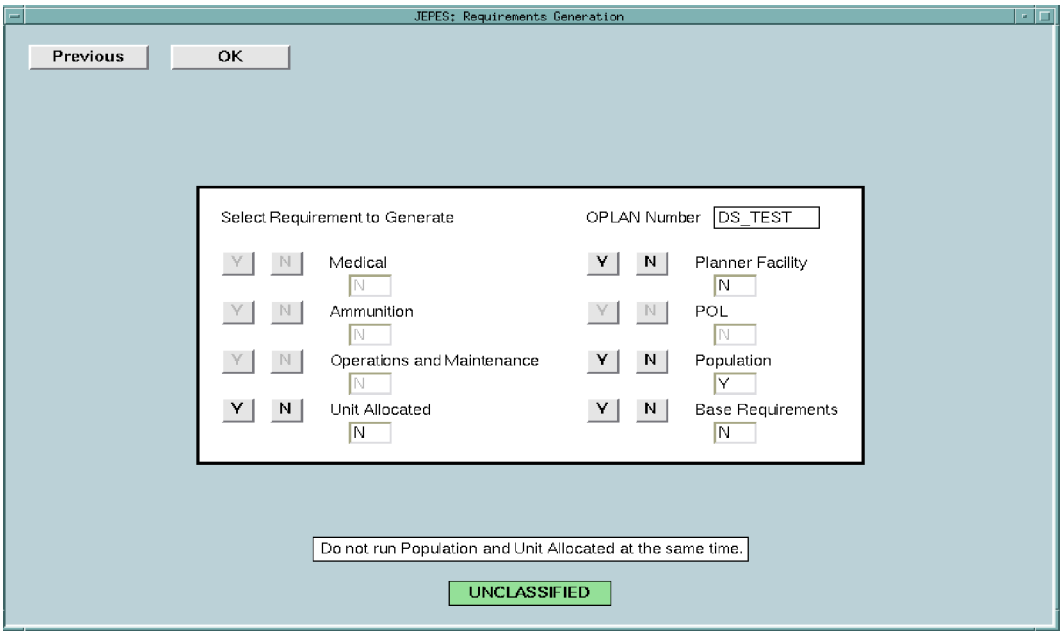


Figure 7.0-15. Requirement Generation

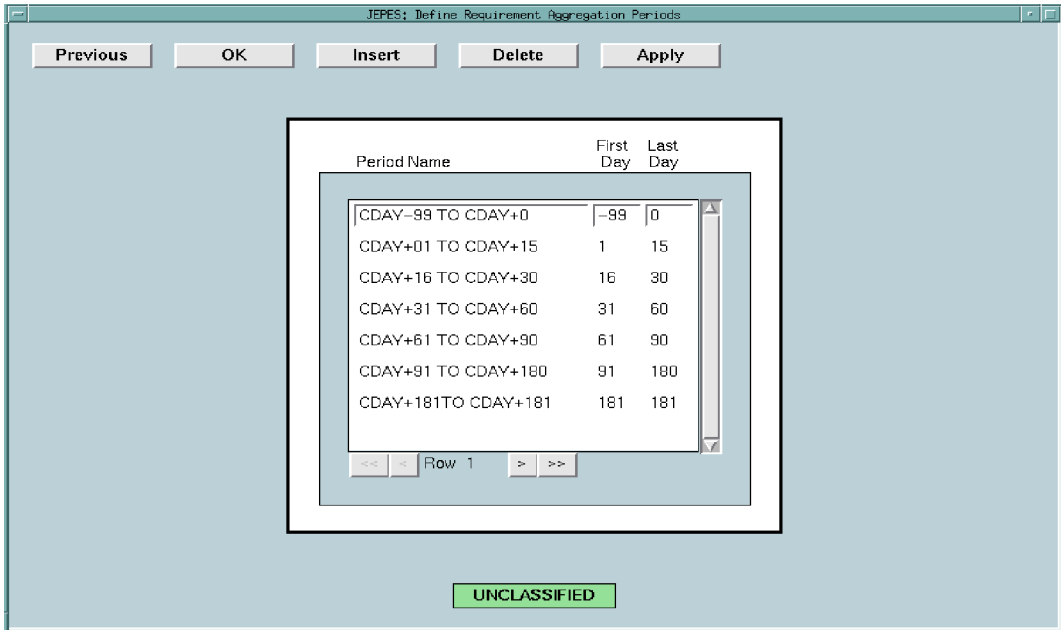


Figure 7.0-16. Aggregation Period

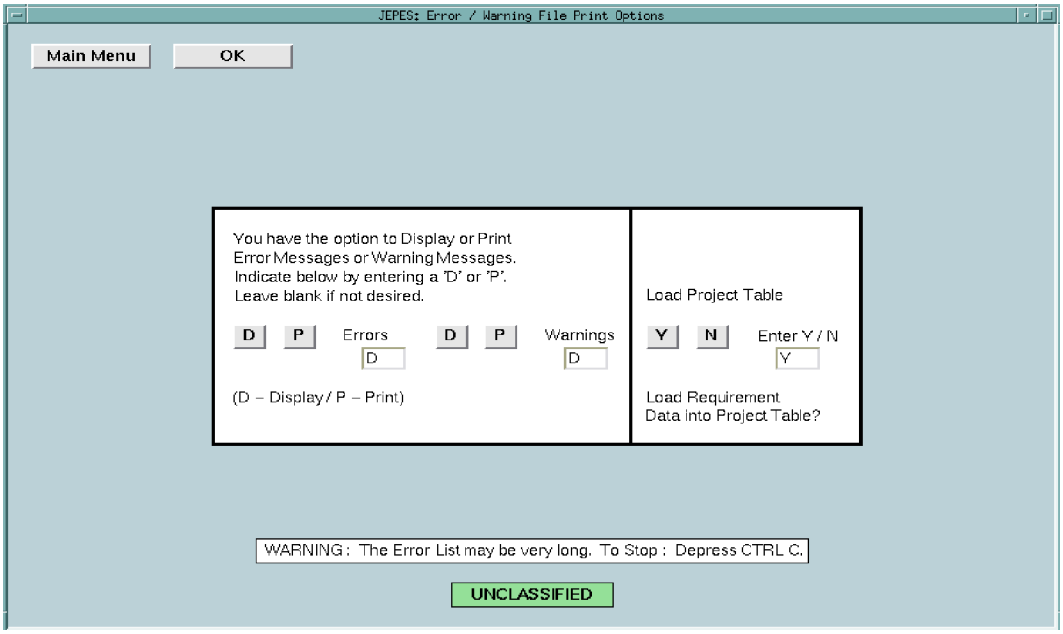


Figure 7.0-17. Requirement Generation Error Report

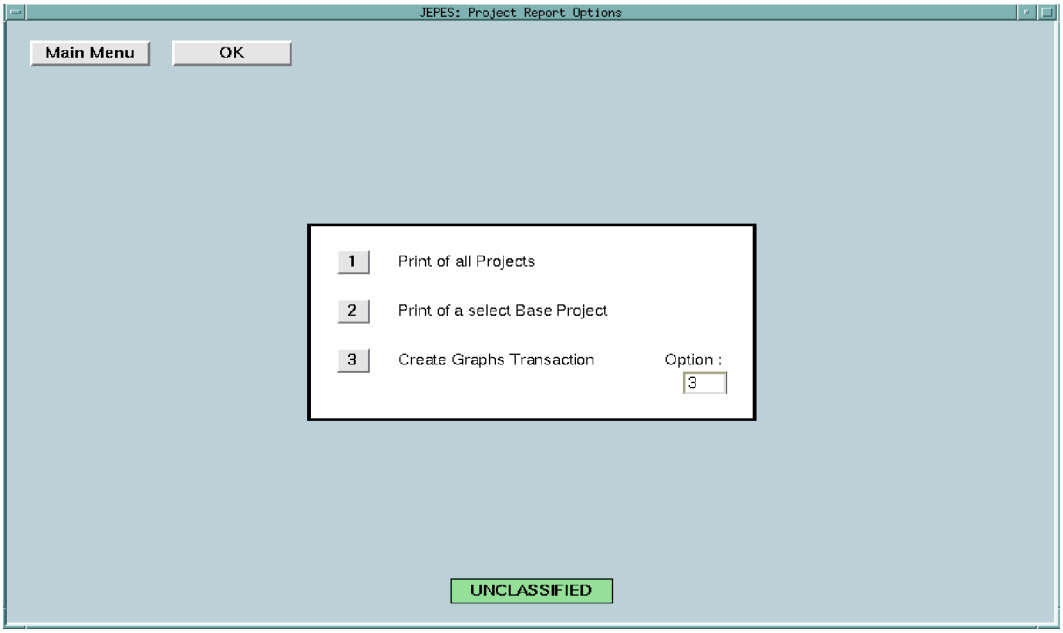


Figure 7.0-18. Requirement Generation Reports

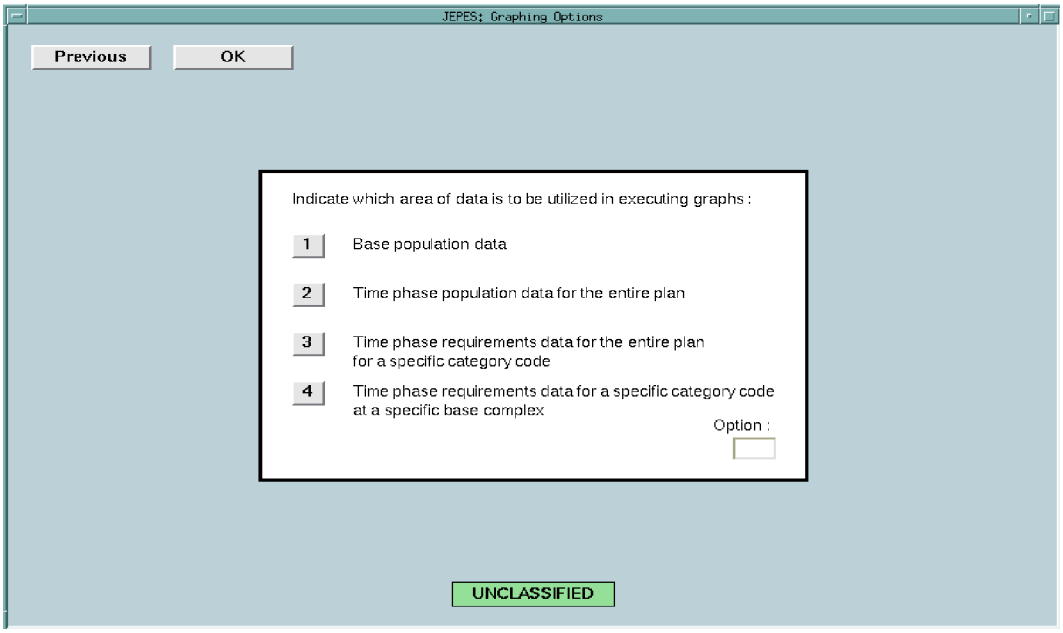


Figure 7.0-19. Requirement Generation Graphs

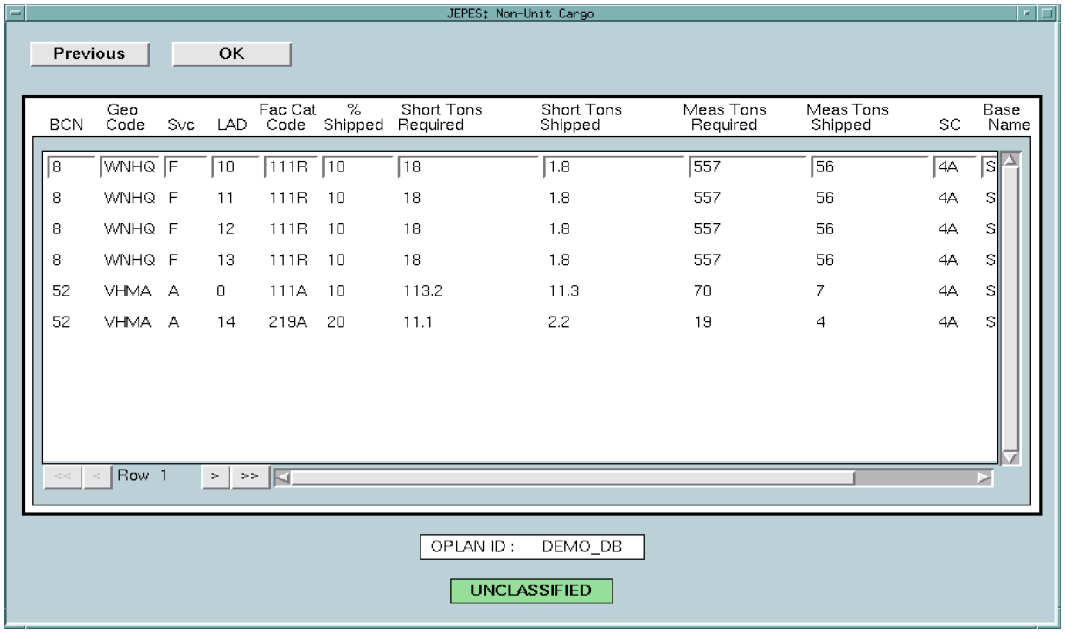


Figure 7.0-20. Non-Unit Cargo

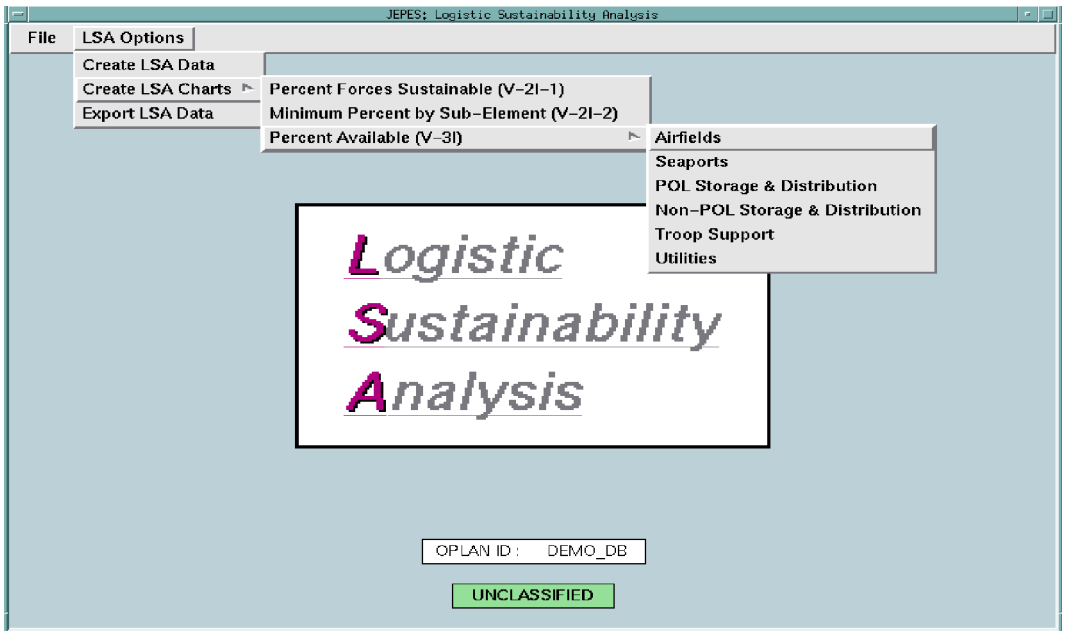


Figure 7.0-21. LSA

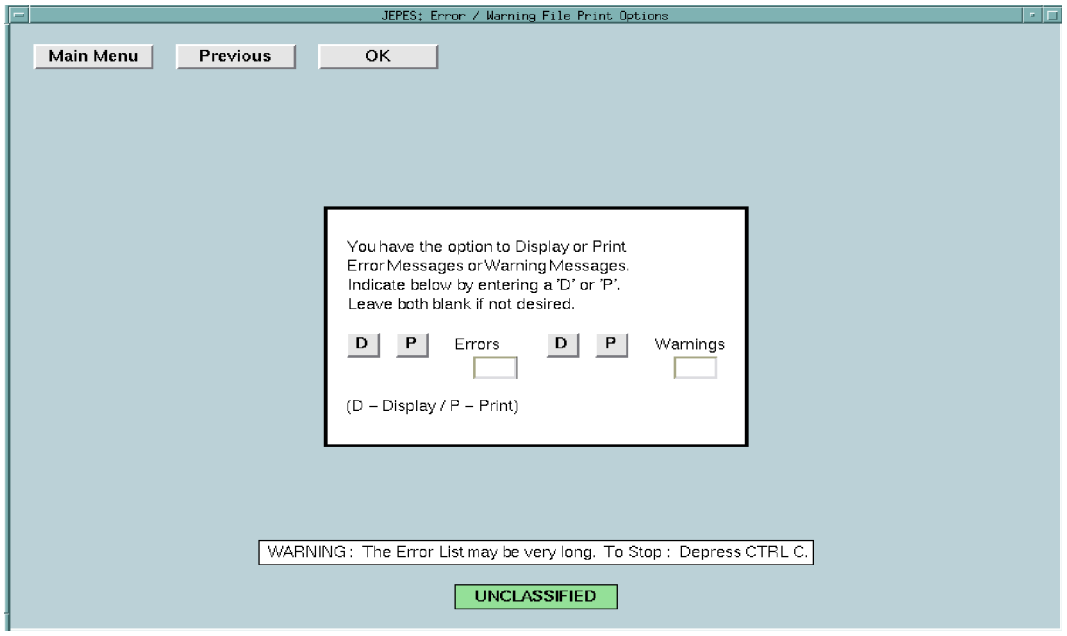


Figure 7.0-22. LSA Error Report

8.0 NOTES

The following is a list of terms, acronyms, and abbreviations used throughout this document.

AHQ	Ad-Hoc Query
ASCII	American Standard Code for Information Interchange
CESP	Civil Engineering Support Plan
DB	Database
GM	Gain Momentum
GCCS	Global Command and Control System
GUI	Graphical User Interface
HN	Host Nation
ID	Identification
JEPES	Joint Engineer Planning and Execution System
JOPES	Joint Operation Planning and Execution System
LOGSAFE	Logistics Sustainment Analysis and Feasibility Estimator
LSA	Logistics Sustainability Analysis
OPLAN	Operation Plan
RDA	Requirements Development and Analysis
RPI	Real Property Inventory
SQL	Structured Query Language
TPFDD	Time-Phased Force Deployment Data
TUCHA	Type Unit Characteristics

APPENDIX A

JOPES USER INTERFACE GUIDELINE

JOPES
User Interface Guideline
Version 2.0
1-30-96

Introduction

This document provides additional guidelines that clarify the GCCS User Interface Style Guide.

User Interface

The user interface standard is based on the MOTIF and GCCS Standard. Below are some of the custom tweaks that we have developed over the course of the development. This standard prevails in any area where there is overlap between the above mentioned standards.

Font Selection

Unless there is a pressing need otherwise, all text should display using the following font:

Font: "System Default"
Size: 10 pt.

Other fonts may not be available on other platforms (NT, HP, etc.) and will cause a performance degradation when the font has to be rendered by Gain.

Window Design Conventions

In accordance with the the MOTIF/GCCS standard, all windows will use the following naming convention for the title area located in the top border of the window:

RDA: <descriptive window title>

Prefacing every window title with "RDA: " allows a user to quickly determine the owner application for a particular window in a multi-application environment.

If a window is revealed as a result of a menu pick or button click, the window title should generally reflect the title of the calling menu pick or button. For example, if a button with the label: "Create Records..." displays a new window to the user, the corresponding window would be titled: "RDA: Create Records".

Windows should be sized to clearly organize and efficiently display all the necessary control elements. Screen real-estate is considered valuable, and so windows should not have large

expanses of empty, non-functional space. Empty space between the border of the window and the containing control elements should be approximately 0.1” to 0.2”.

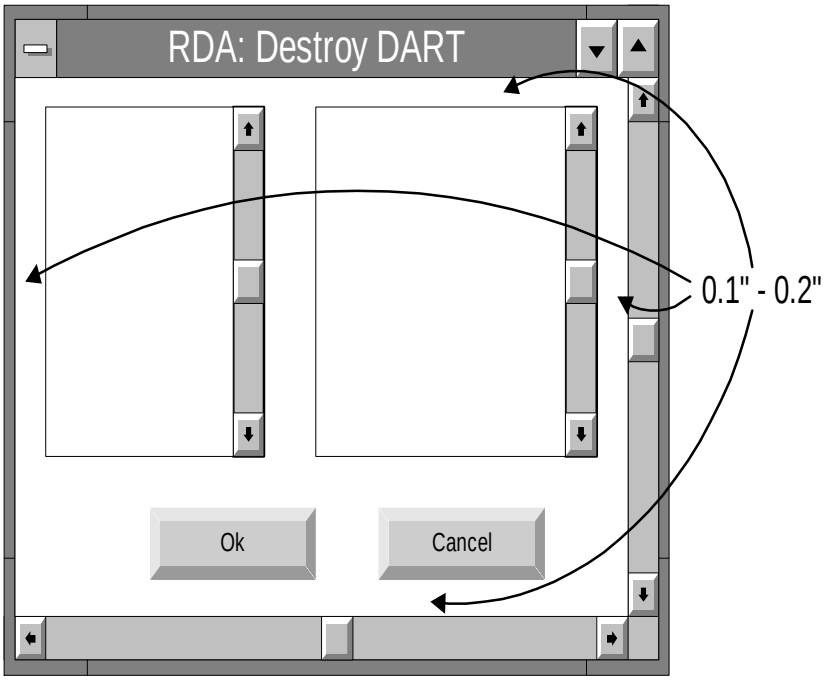


Figure 1. Window Border Sizes

Window Sizing

The maximum size for a window is 9 inches wide by 6 inches high (9 x 6). This sizecomfortably fills the screen of a 14” PC monitor that is displaying at a resolution of 1024 pixels by 768 pixels. This constraint has been applied inorder to accomondate the use of X-server software to display RDA windows on a PC. When running directly on a Sun workstation the resolution is higher (128 pixels by 1024 pixels). This additional screen area allows the Sun user to easily access other applications on the GCCS desktop.

Background and Foreground Color Conventions

The following table provides a description of the general guidelines for adding color to windows. Do not overuse color, only add it where it serves a purpose. We have tentatively settled on the standard set of background colors described below.

User Interface Element	Color Name
Menu Bar and command dialogs[1]	GreenSteelBlue
Dialog window background	SteelBlue
Large working areas, listbox backgrounds	Gray90
Temporary user interface buttons, fields, etc. for use by engineers during development.	LightSlateBlue
Buttons	Gray75
Message line	MediumSkyBlue

Button Height

Unless otherwise required, all non-icon buttons will have a standard height of 0.24 inches (the default provided by Gain). Width is dependent upon button label and context. Buttons that contain icons will be sized to comfortably enclose the icon and associated text.

Button Naming Conventions

All buttons that display a window when they are clicked should have an ellipse ("...") appended to the end of the label to indicate that another window will be displayed as a result of pressing the button.

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[1] Command Dialogs are brought over from the DART convention of having a window that contains a column of buttons and descriptive text located to the right of the button. The bottom of the window contains a simple "Close" button. This type of window maintains the menu bar coloring in order to provide visual distinction from other windows it may appear on top of.

All button labels should use bold text.

Please refer to section 6.1 of the GCCS User Interface Style Guide for a detailed explanation of Push Button naming conventions. Table 6.1 provides a detailed list of button names and the conditions under which those names should be used. The "Executing Control Settings" section has been extracted and provided below.

Executing Control Settings

Button Name	Use
Apply	Executes the control settings in a window but does not close the window.
Cancel	Closes a window without executing the control settings in a window.
Close	Closes a window without executing the control settings in the window; used only in a window when performing actions that are irreversible.
Defaults	Restores all values in a window to a default state defined by the application.
OK	Executes the control settings in a window and closes the window.
Reset	Cancels any changes made to the control settings in a window that have not been applied by the application, and resets the window to the state at the last time a change was applied or to the window's initial state.

Display of Data Fields

Data Field Type	Display Characteristics	Example
Field Label	• "Flat" appearance • **Bold** character formatting	Required:
Read-Only field	• "Flat" appearance • **Bold** character formatting	Exercise
Data-Entry field	• "Sunken" appearance • Normal character formatting	UNCLASS